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March 1, 2010

Ms. Tricia Edwards
On-Scene Coordinator
United States Environmental Protection Agency, Region V
Emergency Response Branch #1
9311 Groh Road
Detroit, MI 48138

**Subject: Reclamation Oil Company Pre-Removal Site Assessment
Detroit, Wayne County, Michigan
Technical Direction Document No. S05-0001-0906-004
Document Control No. 659-2A-AEJX
WESTON START Contract No. EP-S5-06-04
WESTON START Work Order No. 20405.012.001.0659.00**

Dear Ms. Edwards:

The United States Environmental Protection Agency (U.S. EPA) tasked the Weston Solutions, Inc. (WESTON®), Superfund Technical Assessment and Response Team (START) under Technical Direction Document (TDD) No. S05-0001-0906-004 to perform a pre-removal site assessment at the former Reclamation Oil Company in Detroit, Wayne County, Michigan (the Site). The site assessment objectives were to (1) further define the extent of contamination at the Site, (2) refine removal volume estimates, and (3) determine waste characteristics of the soil for potential disposal.

This letter report discusses the Site description, Site history, site assessment activities, analytical results, threat to human health and the environment, volume estimates, and conclusions. This letter report also includes seven attachments. **Attachment A** provides eleven site assessment figures. **Attachment B** provides a photographic log of Site conditions at the time of the site assessment. **Attachment C** provides the soil boring and test pit logs for the site assessment. **Attachment D** provides the summary tables for this letter report. **Attachment E** provides the laboratory data reports for samples collected during the site assessment. **Attachment F** provides data tables summarizing historical soil data. **Attachment G** provides the concrete volume estimate calculations and associated field sketch.

SITE DESCRIPTION

The Site is located at 6472 Selkirk Street, Detroit, Wayne County, Michigan, in the northeast ¼ of Section 29, Township 1 South, Range 11 East (**Attachment A; Figure 1**). The Site is a partially fenced lot measuring 199 by 220 feet (approximately 1 acre) and containing a brick



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building (former warehouse) in the northwest corner. The Site is bordered by commercial/industrial properties to the north, south, and west, and residential properties to the east and southwest. The Site is bounded by Selkirk Street to the north, Foster Street to the east, Farr Street to the south, and an operational railroad line to the west. A concrete truck well/loading dock is present midway along the eastern Site boundary. The remainder of the Site is covered with weathered concrete pavement, concrete floor slabs and footers, and gravel/soil fill material (**Attachment A; Figure 2**). Although **Figure 2** shows the former location of a variety of buildings, the only remaining standing structure is the former warehouse located in the northwest corner of the Site. Only surface concrete is present among the remainder of the former Site buildings.

SITE HISTORY

The Site operated as a chemical manufacturing, storage, and distribution facility from the 1920s through the late 1990s. In April 1999, the U.S. EPA initiated a limited site investigation and removal action to address the threat to public health posed by the presence of hazardous materials at the Site. During U.S. EPA removal activities, approximately 56 aboveground storage tanks, 32 underground storage tanks, 850 55-gallon drums, 200 5-gallon containers, more than 500 small containers, and 300 bags were removed from the Site. Waste removed from the Site included corrosive, flammable, and toxic hazardous waste.

The Michigan Department of Environmental Quality (MDEQ) subsequently conducted site investigations in 2004 and 2008 to determine the nature and extent of contaminants in soil at the Site. Analytical data for surface soil samples collected from the Site indicated that contaminants including, but not limited to, the following were present at concentrations exceeding applicable MDEQ Generic Part 201 cleanup criteria: benzene, toluene, ethylbenzene, xylenes, trimethylbenzenes, trichloroethene, polychlorinated biphenyls (PCB), lead, and arsenic. The MDEQ Part 201 criteria exceeded included Residential and Commercial I Direct Contact Criteria (RDCC), Industrial/Commercial II Direct Contact Criteria (ICDCC) Soil Volatilization to Indoor Air Criteria, and Soil Saturation Screening Levels. Analytical results for storm sewer sediment samples collected from on-site storm drains indicated that contaminants had accumulated in the on-site storm drains. Analytical results for groundwater samples collected from nine on-site monitoring wells installed during the 2008 investigation indicated that volatile organic compounds (VOC), semivolatile organic compounds (SVOC), and/or metals were present in each of the nine wells. Also, visible evidence (a sheen on surface runoff) was observed of contaminants migrating off site on the ground surface.

MDEQ provided a Referral for Removal Action to U.S. EPA Emergency Response Branch #1 dated September 25, 2008 requesting assistance due to the uncontrolled, potentially hazardous contaminants present in shallow soils at the Site. U.S. EPA subsequently sent notice letters to potentially responsible parties (PRP) in January 2009.



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Although discussions with responsive PRPs were initiated regarding a removal action, an agreement on the removal approach could not be reached, and U.S. EPA determined that the next course of action would be to gather the assessment information needed to perform a fund-lead removal action.

SITE ASSESSMENT ACTIVITIES

The site assessment activities were conducted from July 6 through August 5, 2009. Throughout the site assessment, WESTON START conducted air monitoring in the breathing zone and for head space screening using a MultiRAE five-gas meter to measure organic vapors, carbon monoxide, hydrogen sulfide, lower explosive limit [LEL], and oxygen. **Table 1 in Attachment D** summarizes the air monitoring and headspace VOC readings recorded during the site assessment.

To achieve the site assessment objectives defined by the On-Scene Coordinator (OSC), WESTON START advanced 22 soil borings, collected 27 soil samples (including two duplicates), excavated four test pits, collected static water level measurements from the nine on-site groundwater monitoring wells and conducted other activities as discussed below. The photographic log in **Attachment B** shows conditions at the Site during the site assessment and documents site assessment activities.

Soil Boring Advancement

On July 6 and 7, 2009 U.S. EPA OSC Tricia Edwards and WESTON START mobilized to the Site to advance soil borings and collect soil samples. WESTON START advanced 22 soil borings to the depth of a clay layer located at approximately 6 feet below ground surface (bgs). WESTON selected Terra Probe Environmental, Inc., of Ottawa Lake, Michigan, as the drilling subcontractor to advance the soil borings using a Geoprobe.

WESTON START collected 25 soil samples (plus two field duplicate samples) from the 22 soil borings (see "Soil Sampling" below). **Figure 3 in Attachment A** shows the site features and approximate soil boring locations. The 2009 soil boring locations shown in the figure have a "WSB" designation before the boring number to differentiate the 2009 soil borings from the 2008 soil borings. However, the sample identifiers in the analytical data and summary tables indicate "SB" for the 2009 soil boring locations.

Soil Sampling

As discussed above, WESTON START collected 25 soil samples (plus two field duplicate samples) from the 22 soil borings. WESTON START conducted soil sampling activities in Level D personal protective equipment (PPE). Fresh sampling gloves were donned before



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sampling began at each new sampling location. Soil samples were selected for laboratory analysis based on one or more of the following criteria:

- The presence of contamination based on visual evidence such as staining or elevated air monitoring readings;
- The proximity of soil below the ground surface (within the upper 2 to 3 feet bgs) that could pose a direct contact hazard; and
- The depth of the water table.

The soil samples were collected from above the water table from the unsaturated zone. Because the water table typically was encountered at 4 to 6 feet bgs, soil sample collection generally was limited to the upper 5 feet bgs. The 27 soil samples were submitted for laboratory analysis for VOCs, SVOCs, PCBs, and selected metals (arsenic, lead, and cadmium). The analytical program was based on contaminants previously detected at the Site above MDEQ Part 201 RDCC. WESTON START collected the VOC fraction of the soil samples first in accordance with U.S. EPA Method 5035 (methanol preservation) using laboratory-supplied methanol preservation kits. All sample containers were labeled with the sample identification number, date, and time. Samples were hand-delivered under standard WESTON START chain-of-custody procedures to RTI Laboratories of Livonia, Michigan, on July 6, and 7, 2009.

WESTON START recorded soil stratigraphy and sampling information in the site logbook and associated soil boring log as appropriate (**Attachment C**). **Figures 4, 5, 6, and 7 in Attachment A** provide a cross-section transect map and representative cross-sections.

All samples were collected in accordance with the approved, site-specific field sampling plan (FSP) except as follows: a total of 15 soil borings and 25 soil samples were planned, but 22 soil borings were advanced and 27 soil samples (including two duplicates) were collected. The 22 soil borings were sufficient to fill data gaps.

Test Pit Excavation

On July 13, 2009, OSC Tricia Edwards and WESTON START mobilized to the Site to excavate test pits. The purposes of test pit excavation were to (1) collect samples for waste characterization analyses, (2) evaluate excavation conditions to plan for a removal action, and (3) evaluate the presence of free product. The selected remedial services contractor, EQ of Wayne, Michigan, excavated the test pits. **Figure 3 in Attachment A** shows the approximate test pit locations.

A total of four test pits were excavated based on previous (2004 and 2008) analytical data that indicated contaminant concentrations exceeding MDEQ Part 201 RDCC and Soil Saturation



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Screening Criteria. During test pit excavation activities, WESTON START collected five soil samples for laboratory analysis for waste characterization parameters. All sample containers were labeled with the sample identification number, date, and time. Samples were hand-delivered under chain-of-custody procedures to RTI Laboratories of Livonia, Michigan, on July 13, 2009.

WESTON START recorded soil stratigraphy and sampling information in the site logbook and associated test pit log as appropriate (**Attachment C**). The stratigraphy encountered during test pit excavation was consistent with that observed in the soil borings. The water table typically was encountered at approximately 5 feet bgs, and a clay layer typically was encountered at 6 feet bgs. Free product was not observed in any of the test pits. However, excavation collapse at the depth of the water table made it difficult to maintain an open excavation near the termination depth and difficult to determine the presence of free product (**Attachment B – Photographic Log**).

Static Water Level Measurements and Other Activities

OSC Edwards and WESTON START conducted a complete round of static water level measurement at the on-site monitoring wells on July 6, 2009. Static water levels were measured using an oil-water interface probe to detect the presence of free product. Air monitoring was conducted in the well headspace using a MultiRAE five-gas meter. **Table 2 in Attachment D** summarizes static water levels and air monitoring readings recorded at each monitoring well. **Figure 8 in Attachment A** shows the shallow groundwater potentiometric surface. Shallow groundwater flow was north-northwest on July 6, 2009, with some potential localized flow to the east at the eastern Site boundary.

Free product was not detected in any of the wells. However, elevated VOC and LEL readings were detected at several monitoring wells. In some instances, the LEL reading exceeded 100 percent and resulted in the MultiRAE five-gas meter malfunctioning and requiring re-start.

OSC Edwards and WESTON START subsequently mobilized to the site on August 5, 2009, to conduct further air monitoring at the well heads using a GEM 2000 landfill gas analyzer. **Table 2 in Attachment D** provides the GEM 2000 readings for methane and LEL. Elevated methane and LEL readings were recorded at several monitoring wells upon initial well opening. In some cases, the LEL concentrations exceeded 100 percent and were recorded at the Site boundaries.

A subsequent round of readings was recorded after the monitoring wells were allowed to vent. The methane and LEL readings decreased significantly after the monitoring wells were allowed to vent. **Figures 9 and 10 in Attachment A** show the pre- and post-venting methane concentrations and contours, respectively.



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ANALYTICAL RESULTS

Tables 3A through 3D in Attachment D summarize the soil sample analytical results and compare the results to the MDEQ Part 201 RDCC and ICDCC. Attachment E provides the laboratory data reports. Soil samples containing contaminants at concentrations exceeding the RDCC and ICDCC are summarized below. The range of concentrations and contaminants detected are consistent with previous investigation results. Figure 11 in Attachment A shows the boring locations yielding soil samples containing contaminants at concentrations exceeding the RDCC.

2009 SOIL BORINGS WITH SOIL SAMPLES CONTAINING CONTAMINANTS AT CONCENTRATIONS EXCEEDING RDCC

Parameter	Maximum Concentration (µg/kg)	RDCC Value (µg/kg)	Soil Boring Locations
1,2,4-Trimethylbenzene	1,000,000	110,000	WSB-02, WSB-04, WSB-05, WSB-06, SB-20
1,3,5-Trimethylbenzene	350,000	94,000	WSB-02, WSB-04, WSB-06
Xylenes	1,000,000	150,000	WSB-02, WSB-04, WSB-05, WSB-06, WSB-09, WSB-20, WSB-22
Benzo(a)pyrene	4,200	2,000	WSB-11, WSB-12
PCBs	7,700	1,000	WSB-03, WSB-20
Arsenic	17,000	7,600	WSB-01, WSB-02, WSB-9, WSB-10
Lead	420,000	400,000	WSB-01

2009 SOIL BORINGS WITH SOIL SAMPLES CONTAINING CONTAMINANTS AT CONCENTRATIONS EXCEEDING ICDCC

Parameter	Maximum Concentration (µg/kg)	ICDCC Value (µg/kg)	Soil Boring Locations
1,2,4-Trimethylbenzene	1,000,000	110,000	WSB-02, WSB-04, WSB-05, WSB-06, SB-20
1,3,5-Trimethylbenzene	350,000	94,000	WSB-02, WSB-04, WSB-06
Xylenes	1,000,000	150,000	WSB-02, WSB-04, WSB-05, WSB-06, WSB-09, WSB-20, WSB-22
PCBs	7,700	1,000	WSB-03, WSB-20



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Shallow subsurface soil at the Site contains contaminants at concentrations exceeding the RDCC and ICDCC including 1,2,4-trimethylbenzene and xylenes at 1,000,000 µg/kg; which is orders of magnitude (approximately six times) higher than the respective criterion.

For the waste characterization analyses, toxicity characteristic leaching procedure (TCLP) soil sample analytical results were compared to Resource Conservation and Recovery Act (RCRA) levels for hazardous waste toxicity, corrosivity, and ignitability characteristics provided in Title 40 of the *Code of Federal Regulations* (40 CFR), Part 261.24. **Table 4 in Attachment D** summarizes the waste characterization analytical results and compares the results to the RCRA limits. No sample results exceeded the RCRA limits for hazardous waste determination.

THREATS TO HUMAN HEALTH AND THE ENVIRONMENT

Factors to be considered in determining the appropriateness of a potential removal action at a Site are delineated in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) at 40 CFR 300.415(b)(2). A summary of the factors applicable to the Site is presented below.

- **Actual or potential exposure of nearby human populations, animals, or the food chain to hazardous substances or pollutants or contaminants**

Shallow subsurface soil at the Site contains contaminants at concentrations exceeding the RDCC and ICDCC including 1,2,4-trimethylbenzene and xylenes at 1,000,000 µg/kg; which is approximately six times higher than the respective criterion. Other contaminants exceeding the RDCC included 1,3,5-trimethylbenzene, benzo(a)pyrene, arsenic, and lead. PCBs were also detected in shallow subsurface soil during the 2004, 2008, and 2009 investigations at concentrations as high as 340,000 µg/kg; which exceeds both the RDCC, ICDCC, and Toxic Substances Control Act (TSCA) limits.

Analytical results indicate that the contamination extends to the Site boundary. It is possible that contamination has migrated beyond the Site boundary to surrounding utility corridors and potentially to neighboring residential properties. The extent of the contamination has not been fully defined.

WESTON START documented elevated VOC and LEL concentrations on July 6, 2009, and elevated LEL and methane concentrations on August 5, 2009, at on-site monitoring well heads. In some cases, the LEL concentrations exceeded 100 percent and were recorded at the Site boundaries.

The Site is located in an area of mixed residential and industrial use. Residences are located directly east of the Site (across the street), and access to the Site currently is unrestricted. Several attempts have been made to maintain a fence enclosure around



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the Site boundary, but the fence has been repeatedly removed. The southern and eastern Site boundaries are no longer fenced.

Toxic and explosive gases can migrate by the water table and through shallow soil beyond the Site boundary. The groundwater flow direction was to the north-northwest, with potential localized flow to the east on the eastern Site boundary (towards residences). These gases can potentially migrate to nearby substructures, causing an inhalation or explosion hazard. Because elevated contaminant concentrations are present in the shallow subsurface, there is a threat of exposure of nearby residents, utility workers, and Site trespassers.

- **High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate**

Shallow subsurface soil (within the upper five feet) at the Site contains contaminants at concentrations exceeding the RDCC and ICDCC including 1,2,4-trimethylbenzene and xylenes at 1,000,000 µg/kg; which is approximately six times higher than the respective criterion. Other contaminants exceeding the RDCC included 1,3,5-trimethylbenzene, benzo(a)pyrene, arsenic, and lead. PCBs were also detected in shallow subsurface soil during the 2004, 2008, and 2009 investigations at concentrations as high as 340,000 µg/kg; which exceeds both the RDCC, ICDCC and TSCA limits.

MDEQ and U.S. EPA previously observed the presence of visibly contaminated water on concrete surfaces. Sidewalks located along the southern Site boundary are visibly stained. The surface grade at several locations on the Site perimeter are approximately three feet above the surrounding off-site surface grade. Contaminants in the shallow subsurface could continue to migrate onto the surrounding surfaces that are at a lower elevation.

Although most of the Site is covered with concrete, the concrete in many areas is weathered, cracked, and discontinuous. Precipitation will continue to permeate the ground surface and enable continued contaminant migration. Contaminant migration will continue to be conveyed to on-site storm sewers.



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- **Weather conditions that may cause hazardous substances, pollutants, or contaminants to migrate or be released**

Detroit, Michigan, receives an average yearly rainfall of 32 inches and an average yearly snowfall of 41 inches, with temperatures ranging from more than 90 degrees Fahrenheit (° F) to less than 10 °F.

Elevated contaminant concentrations are present in shallow subsurface soil at the Site. MDEQ and U.S. EPA previously observed the presence of visibly contaminated water on concrete surfaces. Sidewalks located along the southern Site boundary are visibly stained. The surface grade at several locations on the Site perimeter are approximately three feet above the surrounding off-site surface grade. Contaminants in the shallow subsurface could continue to migrate onto the surrounding surfaces that are at a lower elevation.

Although most of the Site is covered with concrete, the concrete in many areas is weathered, cracked, and discontinuous. Precipitation will continue to permeate the ground surface and enable continued contaminant migration. Contaminant migration will continue to be conveyed to on-site storm sewers.

- **Threat of fire or explosion**

WESTON START documented elevated VOC and LEL concentrations on July 6, 2009, and elevated LEL and methane concentrations on August 5, 2009, at on-site monitoring well heads. In some cases, the LEL concentrations exceeded 100 percent and were recorded at the Site boundaries.

Toxic and explosive gases can migrate by the water table and through shallow soil beyond the Site boundary. These gases can potentially migrate to nearby substructures, causing an inhalation or explosion hazard.

- **The availability of other appropriate federal or state response mechanisms to respond to the release**

MDEQ provided a Referral for Removal Action to U.S. EPA Emergency Response Branch #1 dated September 25, 2008 requesting assistance due to the uncontrolled, potentially hazardous contaminants present in shallow soils at the Site.

VOLUME ESTIMATES

WESTON START estimated soil volumes requiring removal based on the assumptions summarized below.

- All soil containing contaminants at concentrations exceeding the RDCC will be removed. The estimated area of soil requiring removal is approximately 23,000



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square feet. This area estimate is based on data collected in 2004, 2008, and 2009. **Attachment F** provides summary tables for the 2004 and 2008 data.

- Soil will be removed to the depth of the clay layer (average depth of 6 feet bgs).

The table below summarizes the soil removal estimates. **Attachment G** provides the concrete volume estimate calculations and associated field sketch.

SOIL REMOVAL ESTIMATES

Area (square feet)	Depth (feet bgs)	Volume (cubic feet)	Volume (cubic yards)
23,000	6	138,000	5,120

WESTON START also calculated volume estimates for the areas of concrete that cover the Site surface where removal would occur as summarized below in the table below. The concrete thicknesses presented below are based on surficial and soil boring observations and do not include concrete footings, if present.

CONCRETE REMOVAL VOLUME ESTIMATES – AREAS OF SOIL REMOVAL ONLY

Concrete Section	Area (square feet)	Thickness (inches/feet)	Volume (cubic feet)	Volume (cubic yards)
Southwest Driveway	238	2.5/0.21	125	5
South Concrete	4,140	4/0.33	1,367	51
Southeast Wall ^a	238	8/0.66	79	3
Southeast Concrete	3,078	8/0.66	2,032	76
Farr Street Sidewalk	2,310	4/0.33	763	29
Warehouse Floor	1,924	4 (assumed)/0.33	635	24
Warehouse Wall	1,760	9/0.75	1,320	49
Raised Drum Pad ^a	591	8/0.66	391	15
Pad Surrounding Raised Pad	1,580	4/0.33	522	20
Northeast Corner	4,895	6/0.50	2,448	91
Center Concrete	4,503	8/0.66	2,972	111

Note:

a Steel-reinforced

CONCLUSIONS

WESTON START conducted site assessment activities on July 6, 7, and 13, and August 5, 2009. Site assessment analytical results supplemented information obtained from previous investigations conducted in 2004 and 2008. Site assessment conclusions are summarized below.



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- Contaminants were detected in shallow soil at concentrations exceeding the RDCC and ICDCC. The volume of soil containing contaminants at concentrations exceeding the RDCC is an estimated 5,120 cubic yards. The volume of soil exceeding the ICDCC is included in the 5,120 cubic yards.
- Results for soil samples analyzed for waste characterization parameters indicate that most of the soil would be considered a non-hazardous waste.
- PCBs were detected in shallow subsurface soil during the 2004, 2008, and 2009 investigations at concentrations as high as 340,000 µg/kg; which exceeds both the RDCC, ICDCC, and TSCA limits.
- Elevated VOC, LEL, and methane concentrations were detected in monitoring wells in the central portion of the Site and at perimeter monitoring wells, indicating the potential for toxic and explosive gas migration. Review of the concentrations of organic contaminants in soil indicates enough of a carbon source to suggest that the methane results from anaerobic degradation of contaminants in soil. The pre-and post-venting methane concentrations are similar at other sites where anaerobic degradation is occurring. Collection of water quality parameters, upgradient groundwater samples, and downgradient groundwater samples would provide information needed to evaluate the production of methane from contaminant degradation at the Site.

If you have any questions or comments regarding this letter report or require additional copies, please contact me at (313) 739-2533.

Sincerely,
Weston Solutions, Inc.

A handwritten signature in black ink that reads "Alexandra Clark".

Alexandra Clark
WESTON START Project Manager

Attachments:

- A – Figures
- B – Photographic Log
- C – Soil Boring and Test Pit Logs
- D – Tables
- E – Laboratory Data Reports
- F – Summary of 2004 and 2008 Soil Sample Results
- G – Concrete Volume Estimate Calculations and Field Sketch
- cc: WESTON START DCN File

ATTACHMENT A
FIGURES

ATTACHMENT B
PHOTOGRAPHIC LOG

ATTACHMENT C
SOIL BORING AND TEST PIT LOGS

ATTACHMENT D
TABLES

ATTACHMENT E
LABORATORY DATA REPORTS

ATTACHMENT F

SUMMARY OF 2004 AND 2008 SOIL SAMPLE RESULTS

ATTACHMENT G

CONCRETE VOLUME ESTIMATE CALCULATIONS AND FIELD SKETCH